```
                ;       XSUB RELOCATOR     VERSION 2.2
0020 =          VERSION EQU     20H
                ;       XSUB RELOCATOR PROGRAM, INCLUDED WITH THE MODULE
                ;       TO PERFORM THE MOVE FROM 200H TO THE DESTINATION ADDRESS
                ;
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                ;       93950
                ;
0100                    ORG     100H
0100 01                 DB      (LXI OR (B SHL 3))      ;LXI B,MODULE SIZE
0103                    ORG     $+2                     ;SKIP ADDRESS FIELD
0103 C35701             JMP     START
0106 2045787465         DB      ' Extended Submit Vers '
011C 322E30             DB      VERSION/16+'0','.',VERSION MOD 16+'0'
011F 5873756220NOGO:    DB      'Xsub Already Present$'
0134 5265717569BADVEF   DB      'Requires CP/M Version 2.0 or later$'
                ;
0005 =          BDOS    EQU     0005H   ;BDOS ENTRY POINT
0009 =          PRINT   EQU     9       ;BDOS PRINT FUNCTION
000C =          VERS    EQU     12      ;GET VERSION NUMBER
0800 =          CCPLEN  EQU     0800H   ;SIZE OF CCP
0200 =          MODULE  EQU     200H    ;MODULE ADDRESS
                ;
                START:
                ;       CCP'S STACK USED THROUGHOUT
0157 C5                 PUSH    B       ;SAVE THE MODULE'S LENGTH
0158 3A0600             LDA     BDOS+1  ;XSUB ALREADY PRESENT?
015B FE06               CPI     06H     ;LOW ADDRESS MUST BE 06H
015D C27901             JNZ     LOADERR
0160 2A0600             LHLD    BDOS+1
0163 23                 INX     H
0164 23                 INX     H
0165 23                 INX     H
0166 11DB01             LXI     D,XSUBCON
0169 0E04               MVI     C,4
                PRESENT:
016B 1A                 LDAX    D
016C BE                 CMP     M
016D C28301             JNZ     CONTINUE
0170 23                 INX     H
0171 13                 INX     D
0172 0D                 DCR     C
0173 CA7901             JZ      LOADERR
0176 C36B01             JMP     PRESENT
                ;
                LOADERR:
                ;       BDOS OR XSUB NOT LOWEST MODULE IN MEMORY, RETURN TO CCP
0179 0E09               MVI     C,PRINT
017B 111F01             LXI     D,NOGO  ;ALREADY PRESENT MESSAGE
017E CD0500             CALL    BDOS    ;TO PRINT THE MESSAGE
0181 C1                 POP     B       ;RECALL LENGTH
0182 C9                 RET             ;TO THE CCP
                ;
```

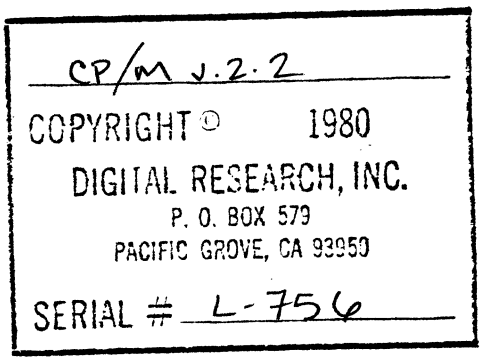

```
                CONTINUE:
0183 0E0C               MVI     C,VERS
0185 CD0500             CALL    BDOS    ;VERSION NUMBER?
0188 FE20               CPI     VERSION ;2.0 OR GREATER
018A D29701             JNC     VERSOK
                ;
                ;       WRONG VERSION
018D 0E09               MVI     C,PRINT
018F 113401             LXI     D,BADVER
0192 CD0500             CALL    BDOS
0195 C1                 POP     B
0196 C9                 RET             ;TO CCP
                ;
                VERSOK:
0197 210700             LXI     H,BDOS+2;ADDRESS FIELD OF JUMP TO BDOS (TOP MEMORY)
019A 7E                 MOV     A,M     ;A HAS HIGH ORDER ADDRESS OF MEMORY TOP
019B 3D                 DCR     A       ;PAGE DIRECTLY BELOW BDOS
019C D608               SUI     (CCPLEN SHR 8)  ;-CCP PAGES
019E C1                 POP     B       ;RECALL LENGTH OF MODULE
019F C5                 PUSH    B       ;AND SAVE IT AGAIN
01A0 90                 SUB     B       ;A HAS HIGH ORDER ADDRESS OF RELOC AREA
01A1 57                 MOV     D,A
01A2 1E00               MVI     E,0     ;D,E ADDRESSES BASE OF RELOC AREA
01A4 D5                 PUSH    D       ;SAVE FOR RELOCATION BELOW
                ;
01A5 210002             LXI     H,MODULE;READY FOR THE MOVE
01A8 78         MOVE:   MOV     A,B     ;BC=0?
01A9 B1                 ORA     C
01AA CAB501             JZ      RELOC
01AD 0B                 DCX     B       ;COUNT MODULE SIZE DOWN TO ZERO
01AE 7E                 MOV     A,M     ;GET NEXT ABSOLUTE LOCATION
01AF 12                 STAX    D       ;PLACE IT INTO THE RELOC AREA
01B0 13                 INX     D
01B1 23                 INX     H
01B2 C3A801             JMP     MOVE
                ;
                RELOC:  ;STORAGE MOVED, READY FOR RELOCATION
                ;       HL ADDRESSES BEGINNING OF THE BIT MAP FOR RELOCATION
01B5 D1                 POP     D       ;RECALL BASE OF RELOCATION AREA
01B6 C1                 POP     B       ;RECALL MODULE LENGTH
01B7 E5                 PUSH    H       ;SAVE BIT MAP BASE IN STACK
01B8 62                 MOV     H,D     ;RELOCATION BIAS IS IN D
                ;
01B9 78         RELO:   MOV     A,B     ;BC=0?
01BA B1                 ORA     C
01BB CAD701             JZ      ENDREL
                ;
                ;       NOT END OF THE RELOCATION, MAY BE INTO NEXT BYTE OF BIT MAP
01BE 0B                 DCX     B       ;COUNT LENGTH DOWN
01BF 7B                 MOV     A,E
01C0 E607               ANI     111B    ;0 CAUSES FETCH OF NEXT BYTE
01C2 C2CA01             JNZ     REL1
                ;       FETCH BIT MAP FROM STACKED ADDRESS
01C5 E3                 XTHL
01C6 7E                 MOV     A,M     ;NEXT 8 BITS OF MAP
01C7 23                 INX     H
```

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```
01C8 E3                 XTHL            ;BASE ADDRESS GOES BACK TO STACK
01C9 6F                 MOV     L,A     ;L HOLDS THE MAP AS WE PROCESS 8 LOCATIONS
01CA 7D         REL1:   MOV     A,L
01CB 17                 RAL             ;CY SET TO 1 IF RELOCATION NECESSARY
01CC 6F                 MOV     L,A     ;BACK TO L FOR NEXT TIME AROUND
01CD D2D301             JNC     REL2    ;SKIP RELOCATION IF CY=0
                ;
                ;       CURRENT ADDRESS REQUIRES RELOCATION
01D0 1A                 LDAX    D
01D1 84                 ADD     H       ;APPLY BIAS IN H
01D2 12                 STAX    D
01D3 13         REL2:   INX     D       ;TO NEXT ADDRESS
01D4 C3B901             JMP     REL0    ;FOR ANOTHER BYTE TO RELOCATE
                ;
                ENDREL: ;END OF RELOCATION
01D7 D1                 POP     D       ;CLEAR STACKED ADDRESS
                ;       H HAS THE HIGH ORDER 8-BITS OF RELOCATED MODULE ADDRESS
01D8 2E00               MVI     L,0
01DA E9                 PCHL            ;GO TO RELOCATED PROGRAM
                XSUBCON:
01DB 78737562           DB      'xsub'
01DF                    END
```

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0134 BADVER	0005 BDOS	0800 CCPLEN	0183 CONTINUE	01D7 ENDREL
0179 LOADERR	0200 MODULE	01A8 MOVE	011F NOGO	016B PRESENT
0009 PRINT	01B9 REL0	01CA REL1	01D3 REL2	01B5 RELOC
0157 START	0020 VERSION	000C VERS	0197 VERSOK	01DB XSUBCON

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